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A NEW GENUS AND FIVE NEW SPECIES OF CHIGGERS (ACARI: TROMBICULIDAE) FROM *ZYZOMYS ARGURUS*[1]

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ABSTRACT

Zyzomyacarus gen. nov. is described. *Zyzomyacarus arguri* sp. nov., *Z. napierensis* sp. nov., *Ascoschoengastia setosa* sp. nov., *Guntheria kethleyi* sp. nov., and *Cotrombicula rugosa* sp. nov., are described from the Common Rock Rat, *Zyzomys argurus* (Thomas, 1889) (Rodentia: Muridae) from Western Australia.

INTRODUCTION

Examination of chiggers from the Common Rock Rat, *Zyzomys argurus*, in Western Australia has revealed a new genus and five new species. Collections of chiggers were made under the direction of Dr F.S. Lukoschus, Catholic University of Nijmegen. Holotypes are deposited in the collection of the Western Australian Museum (Perth), and paratypes there and in the collections of the Bishop Museum (Honolulu), Field Museum of Natural History (Chicago), U.S. National Museum of Natural History (chigger collection currently housed at the Bishop Museum, Honolulu), and Catholic University of Nijmegen. All measurements are given in the holotypes in microns, followed by the means and ranges of type series in parentheses. Terminology follows Brennan & Goff (1977).

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ZYZOMYACARUS GEN. NOV.

Type species: *Zyzomyacarus arguri* sp. nov.
Referred species: *Zyzomyacarus napierensis* sp. nov.

Diagnosis

Trombiculine larvae. Palpal tarsus 5B; palpal subterminala absent; palpal claw 3-pronged; galeala B; cheliceral blade with tricuspid cap; sensilla slightly expanded to narrowly clavate, with setules along entire length; legs 7-7-7 segmented; 2 genualae I, genuala II and III; tibiala III, subterminala and parasubterminala I; no mastisetae on leg III.

Remarks

Zyzomyacarus is similar to *Cricacarus* Vercammen-Grandjean, 1966, in form of sensilla and shape of scutum, but differs in having only 5B on the palpal tarsus (7B or 7BS in *Cricacarus*), galeala B (N in *Cricacarus*) and lacking long, whip-like dorsal and PL setae. In having 5B on the palpal tarsus, *Zyzomyacarus* is similar to *Guntheria* Womersley, 1939, but differs in having only slightly expanded to narrowly clavate sensilla (broadly clavate to globose in *Guntheria*), eyes free on cuticle (ocular plate in *Guntheria*) and lacking attenuated, finely ciliated, apically nude setae (resembling mastisetae) on distal segments of legs III. *Zyzomyacarus* may be separated from the New World genus *Hyponeocula* Vercammen-Grandjean, 1960, in having only 5B on the palpal tarsus (7B in *Hyponeocula*), AM > AL (subequal in *Hyponeocula*) and lacking mastitarsalae III. Having expanded sensilla and lacking mastisetae on leg III along with setation of the palpal tarsus serve to separate *Zyzomyacarus* from *Neotrombicula* Hirst, 1925.

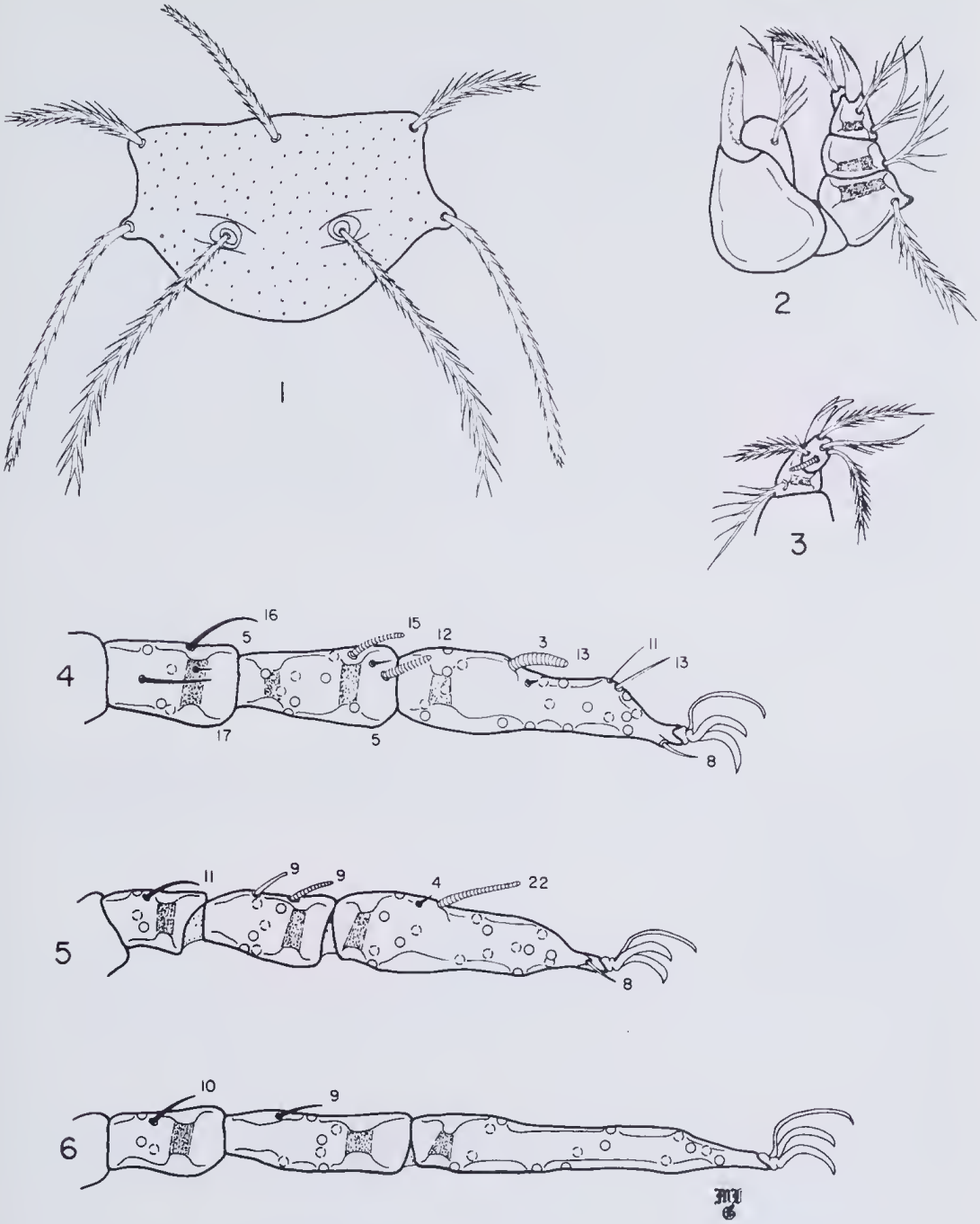
ZYZOMYACARUS ARGURI SP. NOV.

(Figs 1-6)

Type data: Holotype (WAM 79.1581) and 15 paratypes from Western Australia, Kimberley Range, Napier Downs, from 3 *Zyzomys argurus* (2632, 2637, 2660), 31.VIII-14.IX.1976.

Description of species

Larvae. *Idiosoma:* 270 x 170 (engorged). Eyes 2/2, anterior larger, free on cuticle. One pair of humeral setae, 42-56 long; 32 dorsal body setae, 37-58 long, arranged 8-6-6-6-4-2; 2 pairs of sternal setae, anterior 35-37 long, posterior 30-32 long; 22-26 preanal setae, 21-28 long; 14-16 postanal setae, 28-35 long; total body setae = 74-80. *Gnathosoma:* Palpal setal formula



Figs 1-6: Larva of *Zyzomyacarus arguri* sp. nov. Scutum (Fig. 1). Dorsal aspect of gnathosoma (Fig. 2). Ventral aspect of palpal tibia and tarsus (Fig. 3). Distal 3 segments of legs I-III showing specialized setae (measurements in micrometers) and bases of branched setae (Figs 4-6).

B/B/BBB/5B; palpal claw 3-pronged; galeala B; cheliceral blade (26 long) with tricuspid cap; palpal femur with lateral cusp. *Scutum:* Sparsely punctate; anterior margin sinuous; posterior margin evenly rounded; AM base in line with AL bases; SB in line with or slightly posterior to PL bases; PL > AM > AL; sensilla slightly expanded, with setules along entire length; PW/SD = 1.39-1.54. Scutal measurements: AW 61 (60, 57-63); PW 72 (72, 68-74); SB 26 (27, 26-29); ASB 29 (28, 23-30); PSB 21 (22, 20-23); AP 20 (20, 16-22); AM 39 (39, 41-44); AL 30 (29, 21-32); PL 70 (65, 56-72); sens. 70 (66, 56-71). *Legs:* 7-7-7 segmented, terminating in a pair of claws and claw-like empodium. Onychotriches absent. IP = 818-825. *Leg I:* 272-277; coxa with 1 branched seta (1B), trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 2 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (69 x 18) 18B, tarsala (12-13), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II:* 245-252; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B; 2 tibialae, tarsus (63 x 16) 16B, tarsala (21-22), microtarsala, pretarsala. *Leg III:* 295-296; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (82 x 14) 14B.

ZYZOMYACARUS NAPIERENSIS SP. NOV.

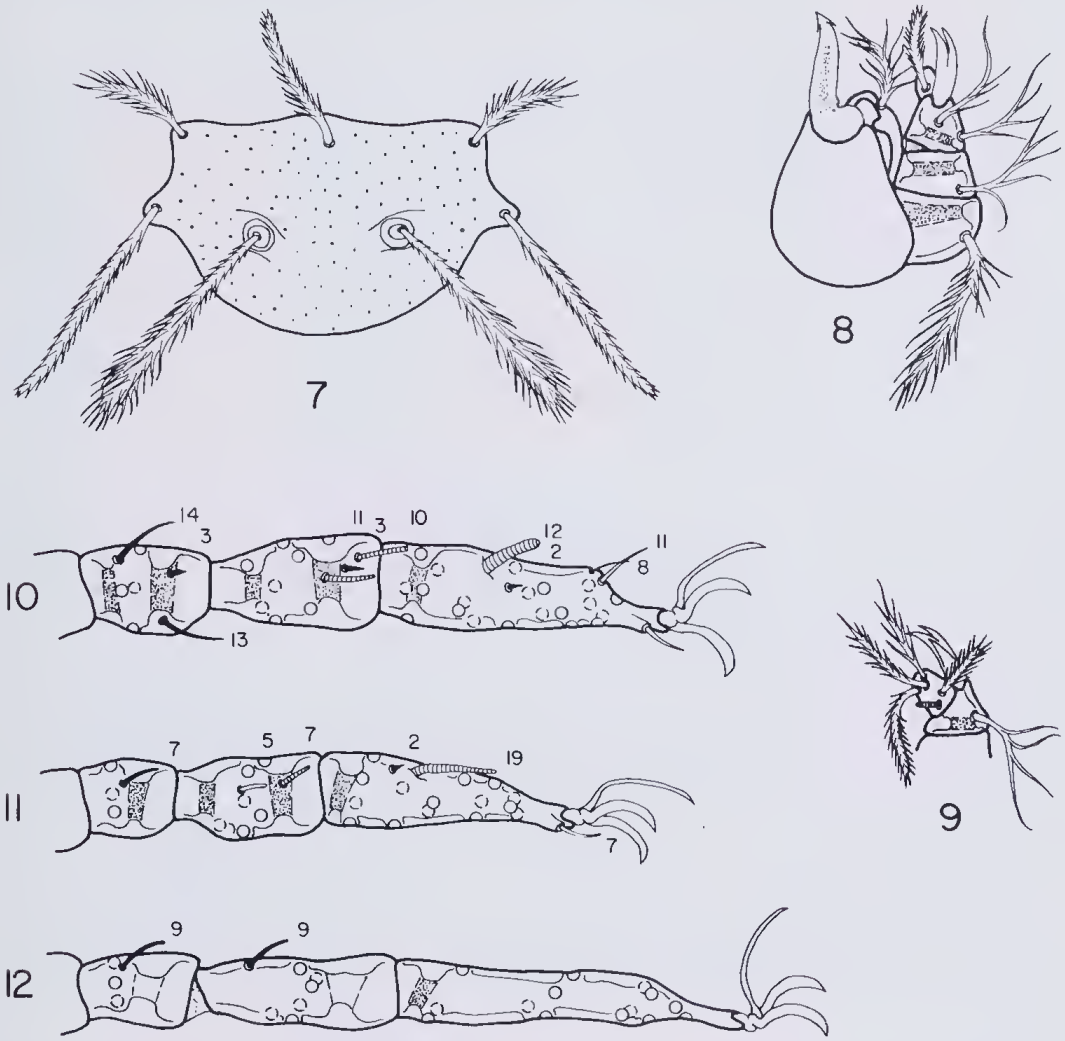
(Figs 7-12)

Type data: Holotype (WAM 79.1582) and 5 paratypes from Western Australia, Kimberley Range, Napier Downs, from 2 *Zyzomys argurus* (2638, 2641), 31.VIII.1976.

Description of species

Larvae. *Idiosoma:* 278 x 183 (engorged). Eyes 2/2, anterior larger, free on cuticle. One pair of humeral setae, 49-51 long; 32 dorsal body setae, 33-44 long, arranged 8-6-6-6-4-2; 2 pairs of sternal setae, anterior 35-40 long, posterior 32-34 long; 20 preanal setae, 28-31 long; 8 postanal setae, 29-30 long; total body setae = 66. *Gnathosoma:* Palpal setal formula B/B/BBB/5B; palpal claw 3-pronged; galeala B; cheliceral blade (25 long) with tricuspid cap. *Scutum:* Lightly punctate; anterior margin shallowly biconcave, posterior margin evenly rounded; AM base in line with or slightly posterior to AL bases; SB posterior to PL bases; PL > AM > AL; sensilla narrowly clavate, with setules; PW/SD = 1.31-1.55. Scutal measurements: AW 60 (62, 60-66); PW 72 (71, 67-76); SB 29 (28, 26-31); ASB 26 (26-28); PSB 23 (23, 22-24); AP 17 (17, 16-18); AM 31 (31, 30-33); AL 24 (27, 24-30); PL 55 (56, 55-58); sens. 56 (57, 56-59). *Legs:* 7-7-7 segmented, terminating in a pair of claws and claw-like empodium. Onychotriches absent.

IP = 702-728. *Leg I:* 231-240; coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 2 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (63 x 20) 20B, tarsala (10-12), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II:* 220-226; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (57 x 17) 15B, tarsala (19), microtarsala, pretarsala. *Leg III:* 251-262; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, genuala; tibia 6B, tibiala; tarsus (7? x 14) 14B.



Figs 7-12: Larva of *Zyzomys napierensis* sp. nov. Scutum (Fig. 7). Dorsal aspect of gnathosoma (Fig. 8). Ventral aspect of palpal tibia and tarsus (Fig. 9). Distal 3 segments of legs I-III showing specialized setae (measurements in micrometers) and bases of branched setae (Figs 10-12).

Remarks

Z. napierensis may readily be distinguished from *Z. arguri* in having clavate sensilla and lacking a lateral cusp on the palpal femur.

ASCOSCHOENGASTIA SETOSA SP. NOV.

Type data: Holotype (WAM 79.1577) and 8 paratypes from Western Australia, Kimberley Range, Brooking Springs, from *Zyzomys argurus* (2854), 30.IX.1976.

Description of species

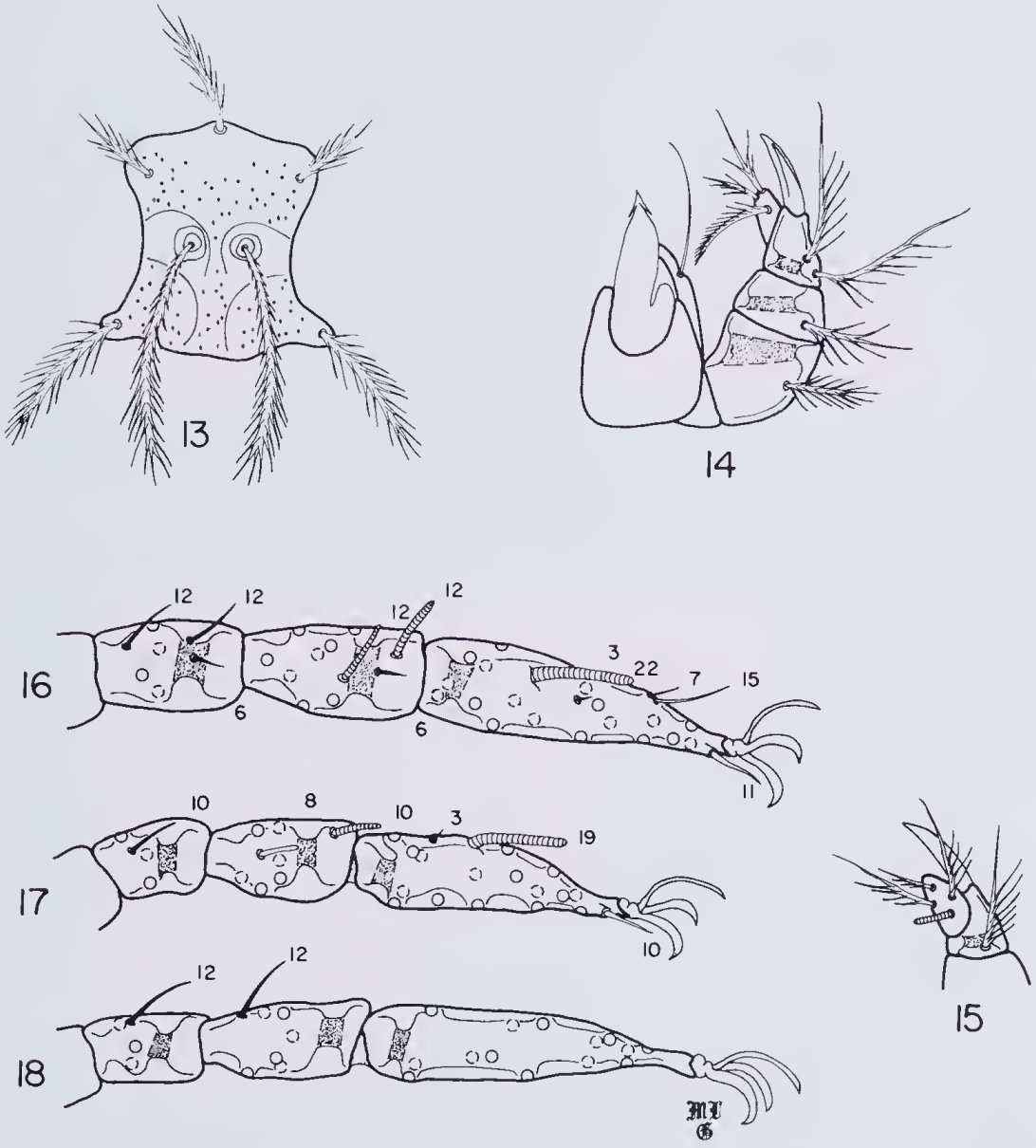
Larvae. *Idiosoma:* 640 x 420 (engorged). Eyes 2/2, inconspicuous, anterior larger, free on cuticle. One pair of humeral setae, 32-34 long; 36 dorsal body setae, 26-35 long, arranged 8-8-6-6-4-4; 2 pairs of sternal setae, anterior 22-28 long, posterior 18-20 long; 38 preanal setae, 16-20 long; 10 postanal setae, 19-25 long; total body setae = 90. *Gnathosoma:* Palpal setal formula B/B/BBB/6B; palpal claw 2-pronged, axial prong internal; galeala N; chelicera blade (28-31 long) with tricuspid cap. *Scutum:* Lightly punctate; anterior margin sinuous with anterolateral shoulders; posterior margin convex; AM base anterior to AL bases, SB anterior to PL bases; PL > AM > AL; sensilla narrowly expanded with setules along entire length; PW/SD = 0.76-1.02. Scutal measurements: AW 35 (34, 31-37); PW 43 (41, 36-47); SB 11 (12, 11-13); ASB 25 (24, 22-26); PSB 21 (21, 19-23); AP 29 (29, 26-30); AM 23 (24, 21-26); AL 16 (18, 16-19); PL 28 (28, 26-31); sens. 48 (46, 43-48). *Legs:* 7-7-7 segmented, terminating in a pair of claws and claw-like empodium. Onychotriches absent. IP = 654-675. *Leg I:* 222-237; coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 2 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (57 x 16) 18B, tarsala (19-22), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II:* 198; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (52 x 14) 16B, tarsala (17-19), microtarsala, pretarsala. *Leg III:* 234-240; coxa 6-7B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala, tibia 6B, tibiala; tarsus (66 x 12) 14B.

Additional specimens examined (13): Western Australia, Kimberley Range, Brooking Springs, 28-30.IX.1976, 4 *Zyzomys argurus* (6); Napier Downs, 31.VIII-2.IX.1976, 3 *Z. argurus* (7).

Remarks

Among Australian species of *Ascoschoengastia*, *A. setosa* may be easily distinguished by the 6-7 branched setae on coxa III and the narrowly expanded sensilla. The scutum of this species appears similar to those of the New World species of *Speleocola* Lipsovsky, 1952. Scutal setae in *A. setosa*

are unusual in being heavily branched. As noted by Nadchatram & Dohany (1974), scutal setae in *Ascoschoengastia* are most frequently sparsely branched or nude.



Figs 13-18: Larva of *Ascoschoengastia setosa* sp. nov. Scutum (Fig. 13). Dorsal aspect of ghathosoma (Fig. 14). Ventral aspect of palpal tibia and tarsus (Fig. 15). Distal 3 segments of legs I-III showing specialized setae (measurements in micrometers) and bases of branched setae (Figs 16-18).

GUNTHERIA KETHLEYI SP. NOV.

(Figs 19-24)

Type data: Holotype (WAM 79.1580) and 14 paratypes from Western Australia, Kimberley Range, Napier Downs, from *Zyzomys argurua* (2637), 31.VIII.1976.

Description of species

Larvae. *Idiosoma:* 490 x 310 (engorged). Eyes 2/2, anterior larger, on ocular plate. One pair of humeral setae, 50-54 long; 28 dorsal body setae, 38-47 long, arranged 6-6-6-6-4; 2 pairs of sternal setae, anterior 45-50 long, posterior 38-40 long; 16 preanal setae, 30-38 long; 16 postanal setae, 31-35 long; total body setae = 66. *Gnathosoma:* Palpal setal formula B/B/NBB/5B; palpal claw 3-pronged; galeala B; cheliceral blade (27 long) with tricuspid cap. *Scutum:* Sparsely punctate; anterior margin biconcave; posterior margin biconvex; AM base in line with AL bases; SB anterior to PL bases; PL > AL > AM; sensilla capitate, head with setules; PW/SD = 2.05-2.54. Scutal measurements: AW 53 (49, 46-53); PW 89 (77, 70-89); SB 23 (22, 18-27); ASB 23 (23, 20-24); PSB 12 (12, 11-13); AP 26 (25, 24-27); AM 38 (39, 35-41); AL 58 (60, 55-70); PL 63 (68, 63-72); sens. 27 (28, 27-29), head 18 x 18. *Legs:* 7-7-7 segmented, terminating in a pair of claws and claw-like empodium. Onychotriches absent. IP = 895-920. *Leg I:* 300-310; coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, genuala, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (85 x 17) 23B, tarsala (11-13), microtarsala, pretarsala. *Leg II:* 270-275; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (107 x 12) 15B. *Leg III:* 325-335; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus (107 x 12) 15B.

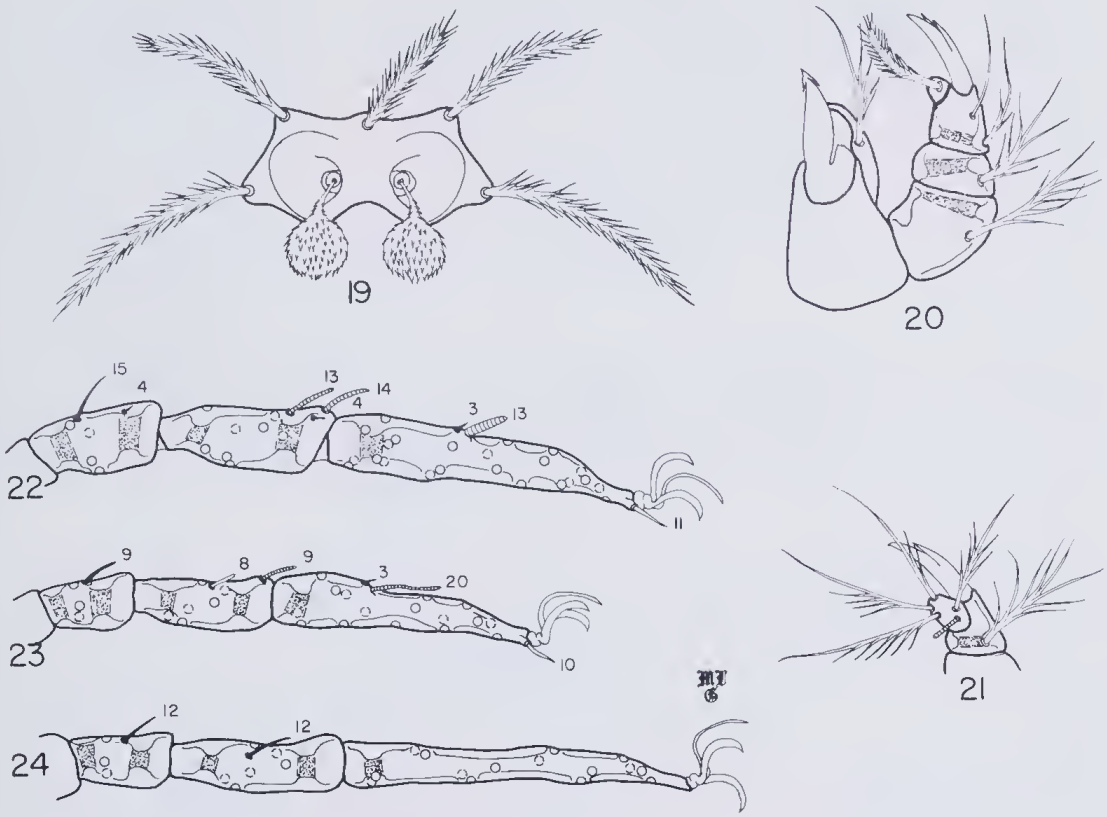
Additional specimens examined (47): Western Australia, Kimberley Range, Napier Downs, 31.VIII-2.IX.1976, 9 *Zyzomys argurus* (33); Brooking Springs, 28.IX.1976, 1 *Z. argurus* (8); Port Warrender, 28.IX-1.X.1976, 3 *Conilurus penicillatus* (6).

Remarks

Among Australian species of *Guntheria* having a single genuala I, only *G. cassiope* (Womersley, 1952), *G. sphinx* Domrow, 1972, *G. daniae* Domrow, 1971, and *G. kethleyi* sp. nov., lack pygosomal plates. *G. kethleyi* may be separated from *G. cassiope* and *G. daniae* by palpotibial setation NBB (NNN in *G. cassiope* and BNB in *G. daniae*), shape of the scutum and lacking both subterminala and parasubterminala I (both present in *G. cassiope* and *G. daniae*). *G. kethleyi* is similar to *G. sphinx* in lacking subterminala and parasubterminala I as well as in the shape of the scutum. Palpotibial setation (NNB for *G. sphinx*), branched galeala (N in *G. sphinx*),

PL > AL (AL > PL in *G. sphinx*) and scutal measurements (AW 52-53, PW 73-74 for *G. sphinx*) serve to separate *G. kethleyi* from *G. sphinx*.

This species is named in honour of Dr John B. Kethley, Field Museum of Natural History, in recognition of his contributions to acarology.



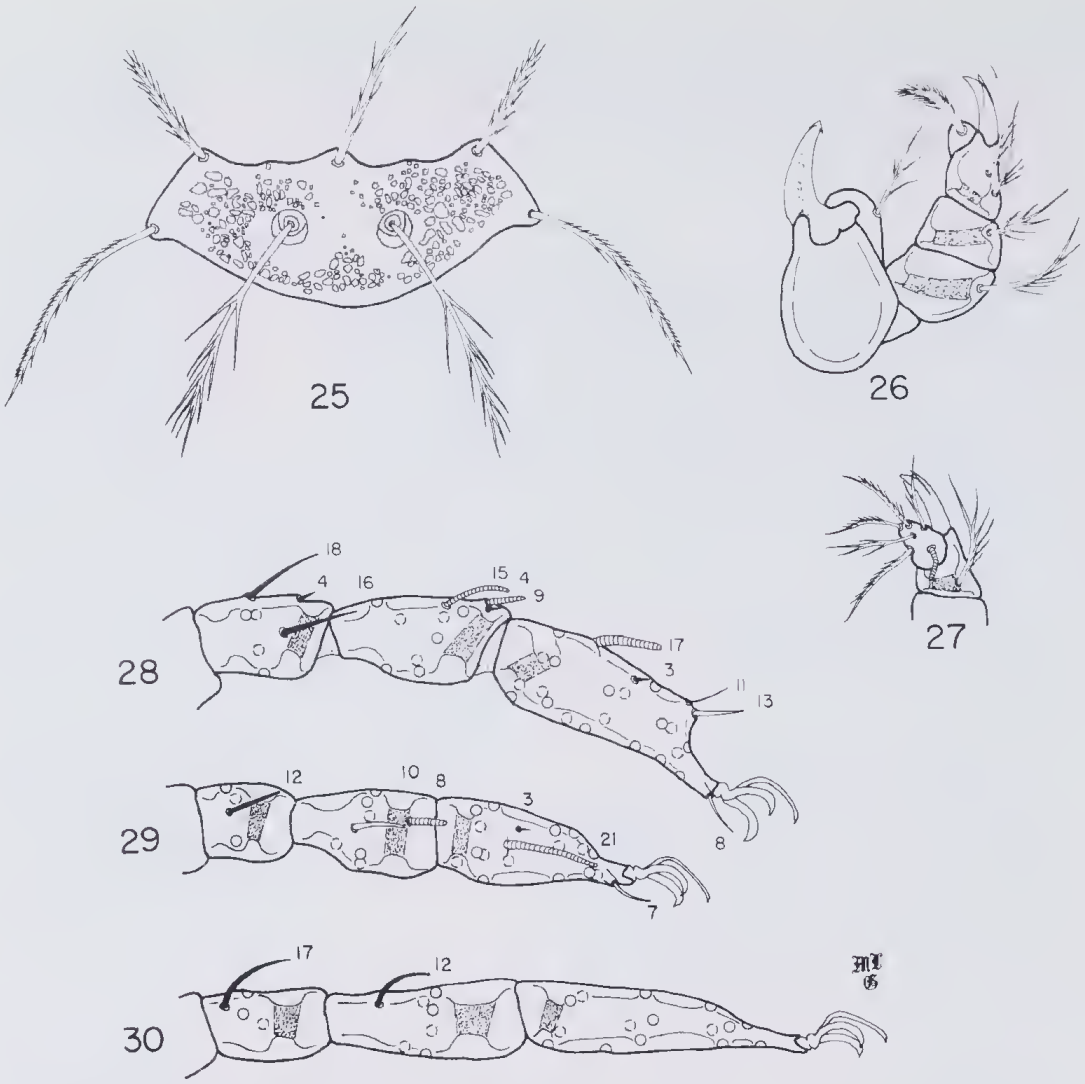
Figs 19-24: Larva of *Guntheria kethleyi* sp. nov. Scutum (Fig. 19). Dorsal aspect of gnathosoma (Fig. 20). Ventral aspect of palpal tibia and tarsus (Fig. 21). Distal 3 segments of legs I-III showing specialized setae (measurements in micrometers) and bases of branched setae (Figs 22-24).

COTROMBICULA RUGOSA SP. NOV.

Type data: Holotype (WAM 79.1579) and 5 paratypes from Western Australia, Port Warrender, from *Zyzomys argurus* (3156) 31.X.1976.

Description of species

Larvae. *Idiosoma:* 157 x 177 (unengorged), appearing truncate in unengorged specimens. Eyes 2/2, anterior larger, free on cuticle. One pair of



Figs 25-30: Larva of *Cotrombicula rugosa* sp. nov. Scutum (**Fig. 25**). Dorsal aspect of gnathosoma (**Fig. 26**). Ventral aspect of palpal tibia and tarsus (**Fig. 27**). Distal 3 segments of legs I-III showing specialized setae (measurements in micrometers) and bases of branched setae (**Figs 28-30**).

humeral setae, 41-44 long; 28 thin dorsal body setae, 30-43 long, anterior rows longer, arranged 8-6-6-4-4; 2 pairs of sternal setae, anterior 35-36 long, posterior 30-31 long; 14 preanal setae, 27-32 long; 4 postanal setae, 28-30 long; total body setae = 52. *Gnathosoma:* Palpal setal formula B/B/BBB/6B; palpal claw 3-pronged, galeala branched; cheliceral blade (26-28 long) with tricuspid cap. *Scutum:* with large, irregular pitting, scrobiculate; anterior margin sinuous; posterior margin convex; AM base in line with AL bases;

SB in line with or slightly anterior to PL bases; PL > AM > AL; sensilla flagelliform with branches on distal 2/3; PW/SD = 2.13-2.19. Scutal measurements: AW 60 (59, 56-60); PW 79 (78, 76-79); SB 21 (21, 20-22); ASB 17 (18, 17-20); PSB 19 (17, 14-19); AP 17 (18, 17-19); AM 35 (31, 26-35); AL 28 (24, 22-28); PL 50 (52, 50-56); sens. 53 (53, 50-56). *Legs:* 7-7-7 segmented, terminating in a pair of claws and claw-like empodium. Onychotriches absent. IP = 680-692. *Leg I:* 235-238; coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 2 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (55 x 19) 20B, tarsala (13-17), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II:* 206-213; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (46 x 18) 16B, tarsala (21-22), microtarsala, pretarsala. *Leg III:* 239-241; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus (58 x 14) 15B.

Remarks

Cotrombicula rugosa is unusual in being recorded from a rodent, as species of *Cotrombicula* are most frequently associated with bats. The species name is derived from the large, irregularly-shaped pits on the scutum.

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